Lesson Plans: Artificial Intelligence

Preparation

Time
45 -60 minutes

Grade
Grades 5 and 6

Overview

The students should see that robots are fun!

Objectives

- Explain **artificial intelligence** in their own words
- Understand the meaning of the word "neural network" (a computer that can learn)
- Gain an appreciation for the field of robotics

Materials

- Computer with **ViaVoice** software installed
- "Design Your Own Robot" Worksheet

Preliminary Setup

You should be familiar with **ViaVoice** and "train" the **ViaVoice** software if possible.

Lesson Body

Introduction

Introduce the topic by telling the students, "Have you ever

played a video game or a computer game and received the message "Please wait...Thinking"? Today we're going to study "thinking" computers -- **artificial intelligence**. **Artificial intelligence** is the field of computer science that tries to answer the following questions: Can computers think? Can we make a computer read, learn, and understand information like a human? Do computers have emotions? We're going to learn about **artificial intelligence** by playing fun games, designing our own robot, and watching exciting video clips."

What do Artificial Intelligence (AI) scientists do?

Tell students that there are two different approaches to **Artificial Intelligence**:

Human Programming

The first approach to creating a thinking computer is human programming. The goal is to program the computer with as many pieces of information as possible. You just feed the computer everything!!! **IBM** used this approach to create the Deep Blue(R) computer. Deep Blue was the computer that beat the world chess champion Gary Kasparov in 1997 in a highly-watched game of chess. Have the students guess the number of chess moves that Deep Blue could consider in just one second. Answer: 200 million chess positions per second! In comparison, Kasparnov could only consider 3 chess positions per second!

Artificial 'Living' Cells

The second approach to **artificial intelligence** involves creating **artificial** "living" cells. Our bodies are made of living cells. Computer Scientists are working to create **artificial** (computerized) cells. They want these **artificial** cells to learn, recognize patterns, and make decisions -- just like humans! AI scientists want the computer to be able to do anything a human can do (and more).

What is a Neural Network

Tell the students, "AI scientists want to build a thinking computer. We don't have thinking computers yet but we have computers which can learn from us. These are called neural networks. A neural network is a computer that can learn over time.?

We have neural networks in our brains. Reading is an example. At first reading is impossible, but after we learn sounds and then words, we can read! Everyday we learn new words and their meanings. We train our brains to understand and recognize these words. This is a neural network because we are learning over time. An example of a neural network on

the computer is voice recognition software. This software can type what you say! To have accurate voice recognition software, we need to train the computer to understand the speaker's voice. Everyone speaks with personal "quirks" in their voice. We need to train the computer to learn these quirks and learn your voice over time. The voice recognition develops and gets better over time.

As an example, the **IBM ViaVoice** Gold 98 software requires 476 (or two hours) of sentences before it is fully accustomed to your voice. Let's try this software out and see it learning!" Demonstrate **IBM's ViaVoice** for the students. Train the software to learn your voice ahead of time.

Demonstrate how the software gives an accurate dictation of your spoken words. Let two or three student volunteers come to the front of the classroom and try the software out. Since **ViaVoice** is not accustomed to their voice, the dictation will probably be less accurate.

After the demonstration is complete, tell the students about these other areas where neural networks are used in computers:

- computers learn your buying habits and give you buying tips
- computers can help doctors diagnose cancer
- computers can learn about what you like and suggest other things you might like
- (Visit amazon.com and see the 'suggested titles you might like' section after you've typed in a search)

Emphasize that a neural network learns from its user.

Class Discussion

The idea of thinking computers scares a lot people. You may want to take a few minutes to have a class discussion. Ask the students, "How do you feel about computers that can think for themselves? How does it make you feel?"

A Brief Introduction to Robotics

After computers have thinking capabilities, then what do we do? We create robots! Tell the students that robotics is the study of building and using robots.

There are two types of robots:

1. The type that are totally controlled by humans. These are called "drones".
2. The "artificially intelligent" type which runs on its thinking skills!

Introduction to Computer Databases

Ask the students to consider what would happen if they needed to have their database store information about every person in the city of Toronto instead of just their team members. Imagine searching and trying to sort through 2+ million index cards... virtually impossible! For this reason, instead of using index cards we use a computerized database such as DB2 Universal Database(TM) from **IBM**.

Tell the students that the MARS pathfinder was a robot! Using the computer, show the students some pictures of the MARS pathfinder and Mars.

Give the students the "Design Your Own Robot" Worksheet. Each student will design a fictional robot to help humans. They will answer questions such as: What does your robot look like? What can it do? Is your robot a drone or a thinking robot? How can your robot help people? Student can sketch a robot draft of their robot on the worksheet and possibly present it to the class.

Lesson Recap

Remind the students that **artificial intelligence** is the study of thinking computers! Tell the students that there are exciting careers in **artificial intelligence** and robotics--from working on the MARS pathfinder expedition, to building robots, to learning about computers and emotion!

Other Fun Activities

Watch a cool animated movie about robots!
http://www.brainpop.com/tech/computeranddigital/robots/index.weml

↑ Back to the top